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ABSTRACT

In conjunction with a literature review, 100 recognized leaders in environmental education and related fields were surveyed via a mail questionnaire for purposes of determining the knowledge and skill concepts deemed necessary for outdoor/environmental education teachers at both the elementary and secondary levels. The survey elicited a 67% response to five questions re: environmental education; program emphasis; course requirements; teacher in-service training; knowledge and skill competency levels; and the general state of teacher preparation programs. Results indicated that undergraduate programs for outdoor educators should include: one or two environmental education courses; an adequate understanding of the biological sciences (biology, botany, history, and philosophy) and environmental and conservation education concepts, history, and philosophy; an integrated or interdisciplinary approach to courses in biology, history, geography, political science, and natural resources; greater emphasis upon elementary teacher preparation curricula. At the graduate level, results indicated teachers needed: a minimum of 30 hours of approved courses; 6 hours of professional education courses; a B average; a 6-year limit on the master's degree; a thesis or research project; specialization in outdoor education and conservation, environmental education studies/problems, or social studies; and field work in various courses. (JC)

SLIPPERY ROCK STATE COLLEGE

# A STUDY OF FACTORS IMPORTANT TO ENVIRONMENTAL (CONSERVATION-OUTDOOR) EDUCATION INSTRUCTION

BY
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A Thesis
Submitted to the Graduate Faculty of
Slippery Rock State College in partial
fulfillment of the requirements for the
degree of Master of Education

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320915


## ABSTRACT

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A Study of Factors Important to Environmental (Conservation-Outdoor) Education Instruction

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### Statement of the Problem

To isolate knowledge and skill concepts deemed necessary for teachers on both elementary and secondary levels to enable them to teach for environmental (conservation-outdoor) education.

### Procedure

A mailed questionnaire was forwarded to leaders in the field of environmental education and related areas. The mailed questionnaire elicited the respondents' opinions concerning five questions: program emphasis, required courses, in-service teacher education, knowledge and skill competency levels, and general state of teacher preparation in environmental education.

## Conclusions

### Undergraduate Program

1. The undergraduate program of teacher educa
   include one or two courses in the area of e
   education.
2. All prospective teachers should have an adequate understanding of the following areas of knowledge:
   a. Biological science: biology, botany, history and philosophy.
   b. Environmental education: concepts, history, and philosophy.
   c. Conservation education: concepts, history, and philosophy.
3. Integrated or interdisciplinary approach to environmental (conservation-outdoor) education is best provided as a part of courses in biology, history, geography, political sciences, and natural resources.
4. Greater emphasis should be placed on environmental education in elementary teacher preparation curricula.

### Graduate Program

1. A minimum of thirty hours in approved courses is required
   a. A maximum of six hours of professional education courses.
   b. An average of "B" must be presented for all graduate work.

c. As a general rule, a master's degree must be completed within a period of six years.

d. A thesis or research project is required of all students as a part of his requirements for the degree.

e. Specialization in one of the following areas:

   1. Outdoor education and conservation

   2. Environmental education studies and problems

   3. Social Studies

f. Field work provided in various courses.

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# CHAPTER I

## INTRODUCTION

> As man reaches out into space, probes the depth of the ocean, and tries to renew the environment for living in its cities, environmental education is reaching for new dimensions. (1:43)

The goal of environmental education is to help man understand that he is absolutely dependent upon his environment. Brennan says:

> Environmental education consists of recognition by man of his interdependence with his environment and with life everywhere, and the development of a culture which maintains that relationship through policies and practice necessary to secure the future of an environment fit for life and fit for living. (4:8)

The attitude of the American people toward natural resources can be attributed in part to historical circumstances and the abundance of natural resources. (6) Many great Americans have a distinguished record in conservation stretching back into our early history. (7) Even the American Indians expressed their feelings about the land and its associated resources through the media of ritual and speech. (24)

A poet wrote in the Kalevala (the epic poem of Finland):

> Osma's barley will not flourish not the barley of Wainola,
> If the soil be not made ready, and the branches burned to ashes,
> Never will the earth unaided yield the ripe nutritous barley. (7:22)

Here the ancient poet points out that nature alone does not give all that is needed--man develops the needed intelligence; he must have a knowledge and understanding of the earth's resources. (14) Men are challenged as never before to acquaint a growing population with a background of essential information pertaining to conservation of natural resources, and their relationship to the total culture of the country. (16) Attitudes must be developed, values must be cultivated, and personal commitments must be made that will withstand the strain of social, economic, and political life of the adult world. (16) The contribution that men can make to the solution of conservation problems will not be in the nature of great undertakings; they must be direct, simple, and immediate. The concepts, beliefs, and convictions formed in the individuals' minds must be clear, fun, and tough enough to stand up under the strenuous pressures of adult life. (16)

Educators express concern that previous environmental education efforts have not proven successful in aiding man to understand his environment. (8) The need for educational standards in environmental concerns must be met in order for

this challenging problem to be alleviated. Throughout the history of teacher education, a serious deficiency has been recognized in the preparation of teachers in regard to environmental education. (8) As early as 1926, Vinal stated:

> The greatest handicap to effective and successful nature study is the lack of teachers trained in methods of nature. (25:2)

While educators are well aware of the importance of natural resources, a need remains for educational programming in conservation at all levels of instruction. (10) There is a need for better, well-planned, well-coordinated, and well-organized efforts by lay people as well as educators in both the school and community. The need should be clearly understood by all Americans, they cannot be told how to do it, they must see for themselves, learn for themselves, and act for themselves. (11)

The purpose of this study was to isolate knowledge and skill concepts deemed necessary for teachers on both elementary and secondary levels to enable them to teach for environmental (conservation-outdoor) education concerns. The study was conducted in four phases. Phase one included a literature search for pertinent and relevant information and consultations with local environmental education experts. Phase two was a mail survey of one hundred recognized leaders in environmental education and related fields. The questionnaire

utilized elicited opinions relative to the field of environmental education. Phase three included an analysis and comparison of data received during phases one and two and an evaluation of this data. The final phase provided for the synthesis of this data, in respect to phase three, in the form of conclusions and recommendations.

## CHAPTER II

## REVIEW OF LITERATURE

> History tells us that earlier civilizations have declined because they did not learn to live in harmony with the land. (1:viii)

It is the knowledgeable men and women who can unlock the secrets of nature and enable man to understand the environment. (3,4,5) Education is faced with a serious problem; most teachers are not equipped to teach for environmental concerns. By and large, elementary teachers are comparatively unaware of the whole resource problem. (6,17) Teachers do not receive an educational background in environmental matters during their preparatory studies, especially elementary teachers. They may be exposed to such potential sources as freshmen biology, social studies, and the physical sciences, but often such courses rarely touch on resource management and environmental ecology. Elementary teachers need ecology and field work to give them a better understanding of the interdependence of life in our environment. (6,17) However, most teachers do not receive a background in environmental concerns:

> Many teachers are not as familiar with the instruction materials that are outside of the classroom. Teachers are not very familiar with curriculum potentials of the natural environment that lie about them just outside

> the classroom door. Teachers have not learned how to manage a group of children in the out-of-doors. Teachers are afraid they will not know what to do. (16:1)

Major problems confronting a teacher without a background in outdoor teaching revolve around two aspects:

1. That of finding an area of suitable study:
2. That of supervising and organizing the class while in the out-of-doors. (18)

The uninformed teacher does not understand the ways that conservation can be taught. They lack the knowledge of instructional methods to teach conservation. Their students do not learn to observe, how to collect facts, how to interpret these facts, and how to sense a close relationship between natural resources, human life, and totality of all nature. (18) These are only a few reasons why environmental education is not a part of the curriculum in many school districts. The answer lies perhaps in the preparation of teachers. (18) This point cannot be overemphasized, since competent teachers are obviously the key to the success of the instructional program. (15)

It is the responsibility of colleges and universities to give guidelines for training future teachers, particularly elementary teachers. (6,18) The 85,000 new elementary teachers who emerged from teacher education institutions in 1969 were inadequately prepared in the recognition and study of the environmental problems that loom as the major concern

of the 1970's. (8) The question could be asked why are the teachers not being prepared? Two possible answers are:

1. Our environmental problems are complex and our technology and economy have not yet developed ways of coping with them so our educational strategy is still uninformed
2. No two communities, indeed no two schools, share identical environmental problems so our educational tactics must be based on each school's own environment. So far, they have not. (8)

The concerned teacher can obtain professional assistance in numerous ways including:

1. Participation in summer institutes and workshops
2. Enrollment in semester-long academic courses
3. In-service training programs. (8,9,15)

In-service training programs should be developed so that skills and knowledges will provide a comprehensive training plan developed to include the following:

1. A clear statement of objectives
2. Time sequence offerings occurring throughout the school year
3. Blending of community environmental experiences with indoor presentations
4. Provision for actual experiences to occur on school sites
5. Development of written material that will offer information as well as methodology

6. Involvement of teachers at all grade levels and subject areas
7. Promotion and publicity of local collegiate offerings and scholarship programs that relate to the environment (10)

If the teacher is to be informed, certain tools must be considered as in-service training programs are developed. The minimum prerequisites would seem to be:

1. Strong general education: educational training that will enable teachers to think clearly and critically; to be able to articulate their thoughts through speech and writing to widen their interest range in daily experiences; and to develop a "questioning mind."
2. Understanding of natural resources: the characteristics, status, distribution, and importance to man
3. Ecological awareness: a blending of field and classroom experiences that will help youth develop a greater interest, awareness, understanding, and respect toward man's environment
4. Economic awareness: an understanding of economic theory so as to determine the role economics has in resource decisions.
5. Political awareness: an understanding of the American political process at national, state, local levels, and ways that the individual can

be effective in helping to promote sound environmental resource decisions

6. Problem-solving: ability to define the problem, consider all related viewpoints, and on the basis of substantial facts, determine the best solution
7. Understanding that man is part of the human ecological system: recognition that man is part of his environment and is expected to make contributions to society according to his ability (10)

Therefore, school systems should provide a strong in-service teacher training program that will assist teachers in acquiring the skills and knowledge necessary to guide the youth they serve. (10)

Another vital component of the total environmental education program is the curriculum. The following points should be considered in relation to the curriculum in an urban school system:

1. Identify "understandings" which are prerequisites regarding natural resources and the natural environment of urban regions
2. Survey the total existing curriculum and determine the most effective way of integrating the understanding into the total school curriculum (K-12) in a manner that will provide the logical continuity and progression

3. Give the learner an opportunity to study community natural resources
4. Stress attitudes and not vocational skills. The most important conservation impact that our urban youth will have upon natural resources will be through their action as community citizens
5. Emphasize local resource problems but do not neglect state, national, or international resource problems
6. Give the learner an opportunity to play an active role in the learning process. The learner develops attitudes through personal experiences and thinking and not through the presentation of predigested conclusions
7. Provide a comprehensive in-service program which operates throughout the school year and is directed at helping teachers increase their understandings, interest, awareness, and teaching skills in conservation (TO)

The college and university can provide the necessary courses for elementary and secondary teachers. In 1968, the Conservation Foundation Committee on Environmental Education in American Universities undertook the task of identifying courses and programs which are available to

general students as well as persons training to be environmental specialists at graduate and undergraduate levels. (8) In preparation for an inventory of environmental education opportunities at several colleges and universities, a pilot study was carried out at the University of Michigan. In order for a course to be considered relevant to environmental education, it was decided that the course must fall into at least one of the following four categories:

1. The course must contribute to the better understanding and knowledge of the physical-biological environment.
2. The course must relate man to his environment
3. It must be a technique or problem-solving course which teaches problem-solving techniques and stimulates students to work towards the solution of problems facing their environment
4. Any remaining courses which they believed were relevant to environmental education, but did not fall into the above three categories

The findings of the University of Michigan study were as follow:

1. Most liberal arts colleges with a student population of less than 1,200 students lack depth of interdepartmental resources to sustain a multidisciplinary program required of a program in

environmental education. Unusual cases do exist where seminars are offered in environmental programs; i.e., Springfield College, Massachusetts, and Beloit College, Wisconsin. In these situations, team teaching often substitutes for a single course taught by different departments in larger universities as in the example of Ohio State University, University of Washington, Massachusetts Institute of Technology, Colorado State University, Wisconsin State University, University of Utah, University of Wisconsin, and others.

2. Many universities have a program or part of it which qualifies as environmental education in a department, or school or institute whose direction and policy are in keeping with a specific discipline such as political science, civil engineering, biology, geology, agricultural economics, or rural sociology. Under these administrative circumstances, it remains unclear whether or not a program or curriculum in environmental education can have adequate breadth for the spectrum of students who may wish to enroll. Examples include Cornell University, Massachusetts Institute of Technology, and Indiana University.

3. The majority of students enrolled in comprehensive environmental education programs or courses were apparently not training for primary or secondary teaching positions at the institutions observed. Most of the students interviewed in the Michigan pretest were not expecting to be teachers. In the nationwide inventory, respondents indicated that students in courses related to environmental studies were probably destined for professional positions in federal, state, and county planning agencies, various research activities, private business and industry, and universities.

4. Several universities present what could be considered model opportunities in environmental education under the definitions of the concept as used in this report. Harvard University via its Committee on General Education, Clarke University (Geography Department), University of Wisconsin (Environmental Studies Committee), Montana State University, University of Michigan (School of Natural Resources), Colorado State University, stand among the leaders.

5. Categorically, all faculty members who were interviewed expressed a willingness to participate in a sharing of skills related to the area of environmental education.

6. Every respondent mentioned or recognized environmental education programs depend on a capable and devoted man or a faculty team that is able to coordinate the content and integrate the fundamental concepts of a program at a given institution. With the schools that were struggling to launch a new program or reorganize one that needs to become relevant to the urban resource problems, "leadership" was given as one of the most vexing problems. Utah State University, University of Colorado, New Jersey Commission on Higher Education and Ohio State Universities serve as illustrations (8)

The resolution of problems in America will continue on an ineffective basis until more and better programs in the area of environmental education can be provided at the college and university levels. (8)

Both investigated a list of conceptual objectives important to understanding environmental education. (17) The concept receiving a ninety percent or greater level of acceptability were ranked in descending order of importance based on a weighted item-mean score, the maximum score was 5.0; the weighted item-scores vary from 4.85 to 2.54. Concepts were arranged and rearranged in lists based on the similarity of content until a topical outline became evident. The content and the weighted item-mean scores were used to determine the relative position of each concept within each

topic in the taxonomy list. It was assured that the panels of scholars represented in the interdisciplinary area of environmental management education and that their judgments of the relative importance of each concept was a true measure of its importance. Twelve concepts were identified with a weighted item-mean score of 4.00 or higher (Table 1).

TABLE 1

TAXONOMY LIST OF CONCEPTS FOR ENVIRONMENTAL EDUCATION BASED ON A WEIGHTED ITEM-MEAN SCORE

| Concept | Weighted Item-Mean Score |
|---|---|
| 1. Living things are interdependent with one another and their environment. 315 essential, 17 highly desirable, 14 desirable | 4.85 |
| 2. Safe waste disposal, including the reduction of harmful and cumulative effects of various solids, liquids, gases, radio-active wastes, and heat, is important if the well-being of man and his environment is to be preserved. 275 essential, 51 highly desirable 17 desirable | 4.65 |
| 3. Man has been a factor affecting plant and animal succession in environmental processes. 246 essential, 66 highly desirable, 28 desirable | 4.58 |
| 4. The management of natural resources to meet the needs of successive generations demands long-ranging planning. 236 essential, 85 highly desirable, 24 desirable | 4.42 |
| 5. Water supplies both in quantity and quality important to all levels of living. 236 essential, 57 highly desirable, 42 desirable | 4.39 |
| 6. Natural resources are interdependent and the use or misuse of one will affect others. 245 essential, 64 highly desirable, 21 desirable | 4.35 |
| 7. The earth and life on it are greatly affected by the atmosphere. 313 essential, 62 highly desirable, 53 desirable | 4.29 |

TABLE 1 (continued)

TAXONOMY LIST OF CONCEPTS FOR ENVIRONMENTAL EDUCATION BASED ON A WEIGHTED ITEM-MEAN SCORE

| Concept | Weighted Item-Mean Score |
|---|---|
| 8. Environmental management involves the application of knowledge from many different disciplines. 186 essential, 52 highly desirable, 58 desirable | 4.27 |
| 9. In any environment, one component like space, water, air, or food may become a limiting factor. 191 essential, 89 highly desirable, 39 desirable | 4.22 |
| 10. Most resources are vulnerable to depletion in quality, quantity, or both. 204 essential, 74 highly desirable, 35 desirable | 4.17 |
| 11. Pollutants and contaminants are produced by natural and man-made processes. 311 essential, 60 highly desirable, 47 desirable | 4.09 |
| 12. Increasing human population, rising levels of living and the resultant demands for greater industrial and agricultural productivity promotes increasing environmental contamination. 204 essential, 71 highly desirable, 22 desirable | 4.01 |

From Roth's list of concepts, it can be readily noticed that:

1. The concepts relating to environmental management education can be identified by utilizing scholars from many disciplines
2. These concepts can be used in curriculum planning
3. These concepts can be divided into sub-concepts and related to other educational conditions
4. These concepts can be taught by using a variety of methods

5. These concepts can be taught at a variety of grade levels and in a variety of ecological settings

An investigation of these concepts indicates that environmental education is pervasive but also integrated. (13) Southern proposed that as a child acquires a broad environmental understanding (knowledge) he will develop a social conscience (attitudes) that will affect his behavior (actions) toward the total environment. Stapp indicates, a strong understanding of how resources are used requires knowledge of the social, political, economic, and asthetic considerations as well as technological processes and institutional arrangements which govern their utilization. (20)

The pervasive nature of environmental education is the study of man and his total relationship to his environment. (13) It is noted that educational curricula have not discussed man's relationship to his total environment in terms of energy flow, values, cultural, social, political, legal and long-range quality implications. (13)

To develop an integrated curriculum, the following concepts can be pursued:

1. Key environmental concepts can be graded by levels: K-3; 4-6; 7-9; and 10-12
2. Concepts can be grouped by relationships economic, culture, ecology, and management

3. Teacher background and interpretive materials can be developed for each concept
4. A variety of student activities can be developed that are relevant and highly motivating and can be inductively taught
5. The teacher can integrate the environmental curriculum into the existing school curriculum (13,15)

Swan indicates that a concern for environmental quality can be created through a comprehensive environmental education program. His program was concerned with involving people with environmental problem solving. The program should span the entire curriculum, K-12. Total involvement is essential, for different components of environmental attitudes have varying susceptibility to influence at different age levels. Children can begin to gain some understanding of their environment in the elementary years. The bulk of early learnings should take place outside of the school building. (22)

Presently, in the Ann Arbor school system, the implementation of an environmental education philosophy is well underway in fourteen different schools involved in school site development projects. In every case, development is being planned by an individual school committee composed of teachers, administrators, ground keepers, and most importantly, students. Typical activities of these school site development programs are planting of wind breaking shrubs

and trees for beautification and to attract wildlife, constructing ponds, and building mounds to add diversity to the site and increase opportunities for creative play. In most cases, students carry out a major share of the planning and developing activities. Moving into the secondary grades, the students begin to study local environmental problems throughout the community. Here the classes from all subject areas of the curriculum begin to focus upon problems relevant to that subject; i.e., art classes are currently working to develop a proposal for beautifying an old bridge. Conservation classes have a small lake on the high school grounds at their disposal and they are currently studying the problems of developing an urban fishery. One of the strongest parts of the Ann Arbor environmental education program is the social studies program. Here there is a study of governmental institutions involved in local environmental management problems. (14)

The response of the Ann Arbor students to their environmental education indicates its greatest strength to be relevance. The educational programs meet student needs and interests. Another important aspect is that of exploring ways in which citizens can truly be effective in local problem solving. Environmental education has been offered as a challenge because it is a new and developing educational concept. It is essential that careful thought be given to

the content of environmental education programs. Such programs must be handled by teachers who are competent to present the social, economic, political and cultural aspects of man's relation to his total environment. The techniques of resources management should not be overemphasized. (14)

## CHAPTER III

## THE OPINION STUDY

An environmental education opinion study was conducted by the author to elicit knowledge and skill concepts deemed necessary for teachers on both elementary and secondary levels to enable them to teach environmental (conservation-outdoor) education.

A mailed questionnaire was forwarded to leaders in the field of environmental education and related areas. A list of potential respondents was drawn from conferences, symposia, membership lists, and authors of magazine articles relative to environmental education.

The mailed questionnaire, with cover letter outlining the purpose of the study, elicited the respondents' opinions concerning concepts of environmental education (Appendix A).

The questionnaire was pretested by twelve faculty members at Slippery Rock State College, and revised prior to submission to the study respondents. The survey response to the initial mailing (67%) was sufficient to negate the necessity for follow-up reminder letters to non-respondents.

A profile of the survey respondents shows that 67% of the respondents were involved in environmental concerns (Table 2).

TABLE 2

PROFILE OF RESPONDENTS TO THE ENVIRONMENTAL EDUCATION OPINION SURVEY

| | |
|---|---|
| TOTAL RESPONDENTS | 67 |
| 1. Academic Degree: | |
| Bachelors | 2 |
| Masters | 19 |
| Doctorals | 46 |
| 2. Major Field: | |
| Agricultural education | 9 |
| Biology | 2 |
| Curriculum | 4 |
| Ecology | 5 |
| Environment and Management Education | 9 |
| Forestry | 8 |
| Geography | 1 |
| Health and Physical Education | 4 |
| Human Development | 2 |
| Natural Resource | 3 |
| Oceanography | 1 |
| Outdoor Education | 5 |
| Recreation Education | 2 |
| Science Education | 3 |
| Supervision | 1 |
| Wildlife Ecology | 4 |
| Zoology | 4 |
| 3. Professional Experience: | |
| Less than Five Years | 6 |
| Five to Ten Years | 10 |
| More than Ten Years | 51 |
| 4. Location of Degree Institution: | |
| Northeast | 20 |
| South | 10 |
| Mid-West | 27 |
| West | 10 |

The opinion study elicited information concerning five questions: program emphasis, required courses, in-service teacher education, knowledge and skill competency levels, and general state of teacher preparation in environmental education.

PROGRAM EMPHASIS

The Question:

Should studies for teachers in outdoor and/or conservation education be offered by teacher preparatory institutions as (see alternatives below)?

The Results:

The respondents showed a slight preference for studies in environmental education as an area of minor emphasis under both undergraduate and graduate degrees and an area of major study for Masters' programs (Table 3). The respondents felt educational opportunities in environmental education should be an area of minor emphasis in degree programs (undergraduate and/or graduate) such as elementary education, secondary education (70%) and as an area of major emphasis for a masters (67%) as indicated in Table 3.

TABLE 3

EDUCATIONAL OPPORTUNITIES IN ENVIRONMENTAL EDUCATION

| | TOTAL | PER CENT |
|---|---|---|
| Elective courses (undergraduate and/or graduate) | 38 | 60% |
| Area of minor emphasis in degree programs (undergraduate and/or graduate) such as elementary education, secondary education | 45 | 70% |
| Area of major emphasis for a Bachelors | 39 | 59% |
| Area of major emphasis for a Masters | 42 | 67% |
| Area of majoreemphasis for a Doctorate | 29 | 49% |

REQUIRED COURSES

The Question:

How many REQUIRED courses in conservation and/or outdoor education should be included in ALL undergraduate education curricula?

TheeResults:

The desirable number of courses indicated two or more should be included in environmental education as indicated by the respondents (Table 4).

TABLE 4

REQUIRED NUMBER OF COURSES

| COURSES | TOTAL | PER CENT |
|---|---|---|
| None | 3 | 4% |
| One | 20 | 30% |
| Two or More | 44 | 66% |

IN-SERVICE EDUCATION

The Question:

What the BEST means to reach IN-SERVICE teachers who have not had formal academic studies in conservation and/or outdoor education?

The Results:

The respondents felt the BEST means to reach IN-SERVICE teachers were through special summer courses or workshops (75%), and graduate courses on college and university campuses (60%). (Table 5)

TABLE 5

IN-SERVICE TEACHER EDUCATION PREPARATION

| | TOTAL | PER CENT |
|---|---|---|
| Afternoon (after school workshops or seminars | 18 | 27% |
| Week-end workshops or seminars | 28 | 42% |
| Organizational conferences (state, national conservation and/or outdoor education organization) | 22 | 33% |
| Graduate courses on college and university campuses | 40 | 60% |
| Special summer courses or workshops | 50 | 75% |

KNOWLEDGE AND SKILL COMPETENCY LEVEL

The Question:

In order for teachers to provide their students with an understanding of the environment and its problems, it is necessary that teachers be prepared with certain environmental (conservation-outdoor) education competencies. Indicate the COMPETENCY LEVEL you feel appropriate for any additional ones you may desire.

NOTE: The AREAS OF KNOWLEDGE should not be viewed as courses--two or more of the areas of knowledge could be combined to form one course. You are asked to respond to the question on the basis of the subject matter within each, not on the basis of a number of courses.

The Results:

The respondents indicated the competency level in group A, B, C categories. The number in group A was seven, group had nineteen, and group C had twenty-two. The respondents felt that teachers should at least have a general knowledge of the subject area either with instruction and/or leadership competency (Table 6).

TABLE 6

COMPETENCY LEVEL GROUPS

COMPETENCE LEVEL A:

| | |
|---|---|
| Human Ecology | Outdoor Teaching Methods |
| Ecology | Conservation |
| Environmental Education (Concepts, history, philosophy) | (Concepts, history, philosophy) |
| Conservation Education | Pollution |

COMPETENCE LEVEL B:

| | |
|---|---|
| General Biology | Tree Identification |
| General Botany | Wildlife Identification |
| Field Botany | Bird Identification |
| Geology | Insect Identification |
| Chemistry | Management |
| Sociology | Political Science |
| Geography | Psychology |
| Outdoor Safety | Environmental Education (Program Administration) |
| Map Drawing | Environmental Education (Area and facility) |
| Land Use Planning | |

COMPETENCE LEVEL C:

| | |
|---|---|
| Oceanography | Survival Skills |
| Astronomy | Nature Crafts |
| Meteorology | Water Sports |
| Archaeology | Hunting Skills |
| Indian Lore | Fishing Skills |
| Folk Lore | Field Sports |
| Camp Administration | Winter Sports |
| Camp Counseling | Landscape Planning |
| Orienteering | Land Surveying |
| Woodcraft | Photography (Nature Study) |
| Taxidermy | |

COMPETENCY LEVEL GROUPS:

A - thorough understanding of the subject area with instruction and/or leadership competency.
B - general knowledge of the subject area without instruction or leadership competency.
C - acquaintance with the subject matter only.

## GENERAL STATE OF TEACHER PREPARATION IN ENVIRONMENTAL EDUCATION

The Question:

In general, how well have teacher preparatory institutions prepared teachers in conservation and/or outdoor education?

The Results:

The respondents indicated the teacher institutions were doing a poor job in preparing teachers in environmental education (92%). (Table 7)

TABLE 7

THE PREPARATION OF TEACHERS IN ENVIRONMENTAL EDUCATION

| | TOTAL | PER CENT |
|---|---|---|
| Excellently | 0 | 0% |
| Fairly | 5 | 8% |
| Poorly | 62 | 92% |

## CHAPTER IV

## ANALYSIS OF DATA

In the review of literature, it was cited that teachers in the elementary and secondary curricula lack adequate preparation due to the fact that colleges and universities are doing an inadequate job in preparing teachers.

A summary comparison of the areas of knowledge deemed important to teachers as gleaned from the literature and those obtained through the study, shows a high degree of agreement (Table 8). The literature review indicated studies in the biological sciences including general biology, general botany, field botany, general zoology, field zoology, ecology, and human ecology to be very important. The opinion study respondents felt that most important of the biological science studies were ecology and human ecology.

Studies in the physical and social sciences were viewed as somewhat less important in both the literature and the opinion study.

Environmental education studies were cited as important both in the literature and the opinion study.

The outdoor leadership and outdoor skills were viewed more important in the literature than in the opinion study. It is felt the reason for this probably lies with terminology. (Appendix C).

Studies in engineering skills, nature study, and natural resources were in agreement both in the literature and the opinion study.

TABLE 8

SUMMARY COMPARISON--AREAS OF KNOWLEDGE DEEMED IMPORTANT

| AREAS OF KNOWLEDGE | LITERATURE SOURCE | OPINION STUDY COMPETENCY LEVEL |
|---|---|---|
| BIOLOGICAL SCIENCE: | | |
| General Biology | 5,6,7,8,10, 11,13,14 | B |
| General Botany | 6,7,8,10,11 12,13,14 | B |
| Field Botany | 6,7,8,10,11, 12,13,14 | B |
| Ecology | 4,5,6,7,8,10, 11,12,13,14 | A |
| Human Ecology | 4,5,6,7,8,10, 11,12,13,14 | A |
| PHYSICAL SCIENCE: | | |
| Geology | 6,7,8,10,11, 12,13,14 | B |
| Oceanography | 6,7,8,10,11, 12,13 | C |
| Astronomy | 6,7,8,10,11, 12,13 | C |
| Meteorology | 6,7,8,10,11, 12,13 | C |
| Chemistry | 6,7,8,10,11, 12,13 | B |

TABLE 8 (continued)

SUMMARY COMPARISON--AREAS OF KNOWLEDGE DEEMED IMPORTANT

| AREAS OF KNOWLEDGE | LITERATURE SOURCE | OPINION STUDY COMPETENCY LEVEL |
|---|---|---|
| SOCIAL SCIENCE: | | |
| Sociology | 7,8,10,11,12,13 | B |
| Archaeology | 7,8,10,11,12,13 | C |
| Geography | 7,8,10,11,12,13,14 | B |
| Political Science | 7,8,10,11,12,13 | B |
| Psychology | 7,8,10,11,12,13 | B |
| Indian Lore | 7,8,10,11,12,13 | C |
| Folk Lore | 7,8,10,11,12,13 | C |
| ENVIRONMENTAL EDUCATION: | | |
| Environmental Education (concepts, history, philosophy) | 1,2,5,7,8,10,11, 12,13,14 | A |
| Environmental Education (Program administration) | 1,2,5,7,8,10,13, 14 | B |
| Environmental Education (Area and Facility) | 1,2,5,7,8,10,11, 12,13,14,15 | B |
| Conservation Education | 1,2,5,7,8,10,11, 12,13,14 | A |
| Outdoor Teaching Methods | 1,2,6,7,8,10,11, 12,13,14,15,16 | A |
| OUTDOOR LEADERSHIP: | | |
| Camp Administration | 7,10,12,15,16 | C |
| Camp Counseling | 7,10,12,15,16 | C |

TABLE 8 (continued)

SUMMARY COMPARISON—AREAS OF KNOWLEDGE DEEMED IMPORTANT

| AREAS OF KNOWLEDGE | LITERATURE SOURCE | OPINION STUDY COMPETENCY LEVEL |
|---|---|---|
| OUTDOOR SKILLS: | | |
| Camping skills | 2,6,7,10,12,15,16 | C |
| Orienteering | 2,6,7,10,12,15,16 | C |
| Woodcraft | 2,6,7,10,12,15,16 | C |
| Survival skills | 2,6,7,10,12,15,16 | C |
| Outdoor Safety | 2,6,7,10,12,15,16 | B |
| Nature crafts | 2,6,7,10,12,15,16 | C |
| Water sports | 2,6,7,10,12,15,16 | C |
| Hunting skills | 2,6,7,10,12,15,16 | C |
| Fishing skills | 2,6,7,10,12,15,16 | C |
| Field sports | 2,6,7,10,12,15,16 | C |
| Winter sports | 2,6,7,10,12,15,16 | C |
| ENGINEERING SKILLS: | | |
| Landscape Planning | 1,2,7,8,10,11,12 | C |
| Land surveying | 1,2,7,8,10,11,12 | C |
| Map drawing | 1,2,7,8,10,11,12 | B |
| Land Use Planning | 1,2,7,8,10,11,12 | B |
| NATURE STUDY: | | |
| Tree identification | 6,7,10,12,15,16 | B |
| Wildlife identification | 6,7,10,11,12,15,16 | B |
| Bird identification | 6,7,10,11,12,15,16 | B |
| Insect identification | 6,7,10,12,15,16 | B |
| Photography (nature study) | 7,10,12,15 | C |
| Taxidermy | 7,10,12,15 | C |

TABLE 8 (continued)

SUMMARY COMPARISON--AREAS OF KNOWLEDGE DEEMED IMPORTANT

| AREAS OF KNOWLEDGE | LITERATURE SOURCE | OPINION STUDY COMPETENCY LEVEL |
|---|---|---|
| NATURAL RESOURCES: | | |
| Conservation (concepts, history, philosophy) | 1,2,5,6,7,8,10, 12,13,14 | A |
| Management | 1,2,5,6,7,8,10,11 | B |
| Pollution | 1,2,6,7,8,10,11,12 | A |

NOTE: Opinion Study Competency Level

A - thorough understanding of the subject area with instruction and/or leadership competency.

B - general knowledge of the subject area without instruction or leadership competency.

C - acquaintance with the subject area only.

D - not necessary for teachers.

## CHAPTER V

## CONCLUSIONS AND RECOMMENDATIONS

The data obtained through this study along with a review of materials from nine colleges and universities offering environmental (conservation-outdoor) education programs showed the following conclusions. The conclusions drawn in the study will be stated in the form of recommendations.

### UNDERGRADUATE PROGRAM

Philosophy:

Environmental education is a method of education which utilizes environmental resources outside of the formal classroom. It is used to teach what can be more effectively learned through the environmental approach. Outdoor activities develop the skills, attitudes, concepts, and intellectual processes necessary for the understanding of environmental interrelationships. Since no curriculum area has a monopoly on the use of outdoor resources, environmental education is multidisciplinary. It is logical, however, to assume that the potential for some subjects is greater than for others. Because of urbanization and contamination and depletion of our natural resources, environmental (conservation-outdoor) education has become significantly important. Intelligent planning and decision-making in regard to the use of the land have, therefore, become

necessary. Civilization's survival relies, in part, upon the development of a conservation ethic. The citizenry must become aware of men's effect on his natural and cultural environment.

School administrators, teachers, conservationists, recreation leaders, and others in related professions need to gain insight into the teaching and learning potential of environmental education. The growth and expansion of environmental education depends, in part, upon the pre-service and in-service leadership preparation.

The purpose of the undergraduate program is:

1. To promote environmental (conservation-outdoor) education in accordance with the goals of teacher preparation
2. To further local, state, regional, and national goals relative to education for environmental resource use

Undergraduate Program Outline:

A student should not major in environmental (conservation-outdoor) education; however, the student may choose to emphasize environmental education within any number of majors--for example, elementary education, recreation education, or forestry.

Recommendations:

The following are the suggested recommendations for the undergraduate program:

1. The undergraduate program of teacher education should include one or two courses in the area of

environmental education

2. All prospective teachers should have an adequate understanding of the following areas of knowledge:
   a. Biological Science: biology, botany, zoology, human ecology, and ecology
   b. Environmental Education: concepts, history, and philosophy
   c. Conservation Education: concepts, history, and philosophy
3. Integrated or interdisciplinary approach to environmental (conservation-outdoor) education is best provided as a part of courses in biology, history, geography, political science, education, and natural resources
4. Greater emphasis should be placed on environmental education in elementary teacher preparation curricula

GRADUATE PROGRAM

Philosophy:

The environmental (conservation-outdoor) education program is designed to prepare personnel to fill leadership roles in this field. A re-awakened public conscience about the wise use and proper management of all natural resources, throughout the nation, has focused on the need for teachers to use the outdoors as a potent tool in developing attitudes and knowledges concerning the use of natural resources.

Educators enrolled in the environmental education programs are given the necessary course work and training to gain a depth of knowledge and skills in environmental (conservation-outdoor) education. They will be prepared to make full use of the potentials of the outdoor laboratory. Teachers trained to develop outdoor activities and expanded learnings in conservation, will effect curriculum enrichment in their schools. Intensity of learning and social development have characterized many of the successful outdoor programs sponsored thus far. The value of environmental learnings cannot be stressed enough as states cope with air and water pollution and a population spread which threatens all open space for future generations.

These vital problems are some of the concerns of the master's program which is designed to meet the needs of the outdoor leaders for youth and adults of all ages.

Graduate Program Outline:

1. A minimum of thirty hours in approved courses is required
   a. A maximum of six hours of professional education courses
   b. An average of "B" must be presented for all graduate work
   c. As a general rule, a master's degree must be completed within a period of six years

d. A thesis or research project is required of all students as a part of his requirements for the degree

e. Specialization in one of the following areas:

1. Outdoor education and conservation
2. Environmental education studies and problems
3. Social studies

f. Field work provided in various courses

Recommendations:

The following are the suggested recommendations for the graduate program:

1. Environmental education should be an area of major study for Master's programs
2. Environmental education should be an area of minor emphasis in graduate programs such as elementary education, secondary education, etc.
3. In-service teachers can be reached through graduate courses on college and university campuses
4. Teacher institutions need to improve the teacher preparation in environmental education

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# APPENDICES

# APPENDIX A

APPENDIX A-1

LETTER OF TRANSMITTAL
FOR OPINION SURVEY

RECREATION DEPARTMENT

March 3, 1970
Slippery Rock State College
Slippery Rock, Pennsylvania

Dear

We are in the process of developing a new academic program in environmental (conservation-outdoor) education for elementary and secondary teachers. In an effort to establish an effective and relevant program, we are conducting a survey of leaders in the field relative to the conservation-outdoor knowledge and skills deemed important.

As a recognized leader, we are asking your assistance and participation in the survey. The enclosed questionnaire elicits your opinion concerning several aspects of environmental education. Your comments concerning other important aspects not included on the questionnaire will be greatly appreciated.

Your opinion will be an important contribution, and we hope you will be able to assist us in this endeavor. A summary of the results will be sent to you.

Very truly yours,

Wanda Buterbaugh

Wanda Buterbaugh
Project Director



slippery rock, pennsylvania 16057

APPENDIX A-2

QUESTIONNAIRE

SURVEY OF OPINIONS ON ENVIRONMENTAL (CONSERVATION-OUTDOOR) EDUCATION

I.

1. Should studies for teachers in outdoor and/or conservation education be offered by teacher preparatory institutions as (Check as many as appropriate)

____ Elective courses (undergraduate and/or graduate)
____ Area of minor emphasis in degree programs (undergraduate and/or graduate) such as elementary education, secondary education, etc.
____ Area of major emphasis for a Bachelor's
____ Area of major emphasis for Masters
____ Area of major emphasis for Doctorate.

Comments: _____

2. How many REQUIRED courses in conservation and/or outdoor education should be included in all undergraduate teacher education curricula?

____ None
____ One
____ Two or more

Comments: _____

3. What are the BEST means to reach IN-SERVICE teachers who have not had formal academic studies in conservation and/or outdoor education? (Check as many as appropriate)

____ Afternoon (after school workshops or seminars.
____ Week-end workshops or seminars.
____ Organizational conferences (state or national conservation and/or outdoor education organization).
____ Graduate courses on college and university campuses.
____ Special summer courses or workshops.

Comments: _____

4. In order for teachers to provide their students with an understanding of the environment and its problems, it is necessary that the teachers be prepared with certain environmental (conservation-outdoor education competencies. Please indicate the COMPETENCE LEVEL you feel appropriate for teachers in those AREAS OF KNOWLEDGE shown below, and add any additional ones yourmay desire.

NOTE: The AREAS OF KNOWLEDGE shown below should not be viewed as individual courses--two or more of the areas could be combined to form one course. You are asked to respond to the question on the basis of the subject matter within each, not on the basis of a number of courses.

COMPETENCY LEVEL:

A - thorough understanding of the subject area with instruction and/or leadership competency.
B - general knowledge of the subject area without instruction or leadership competency.
C - Acquaintance with the subject area only.
D - not necessary for teachers.

| | A | B | C | D |
|---|---|---|---|---|
| BIOLOGICAL SCIENCE | | | | |
| a. General Biology | | | | |
| b. General Botany | | | | |
| c. Field Botany | | | | |
| d. General Zoology | | | | |
| e. Field Zoology | | | | |
| f. Ecology | | | | |
| g. | | | | |
| h. | | | | |
| i. | | | | |
| PHYSICAL SCIENCE | | | | |
| a. Geology | | | | |
| b. Oceanography | | | | |
| c. Astronomy | | | | |
| d. Meteorology | | | | |
| e. Chemistry | | | | |
| f. | | | | |
| g. | | | | |
| h. | | | | |
| SOCIAL SCIENCE | | | | |
| a. Sociology | | | | |
| b. Archaeology | | | | |
| c. Geography | | | | |
| d. Political Science | | | | |
| e. Psychology | | | | |
| f. Indian lore | | | | |
| g. Folk lore | | | | |
| h. | | | | |
| i. | | | | |
| OUTDOOR LEADERSHIP | | | | |
| a. Camp administration | | | | |
| b. Camp counseling | | | | |
| c. | | | | |
| d. | | | | |
| e. | | | | |

| | A | B | C | D |
|---|---|---|---|---|
| ENVIRONMENTAL EDUCATION | | | | |
| a. Environmental Educ. (history, philosophy, concepts) | | | | |
| b. Conservation educ. methods | | | | |
| c. Environmental educ. program administ. | | | | |
| d. Environmental educ. area and facility development | | | | |
| e. Outdoor teaching methods | | | | |
| f. | | | | |
| g. | | | | |
| h. | | | | |
| OUTDOOR SKILLS | | | | |
| a. Camping skills | | | | |
| b. Orienteering | | | | |
| c. Woodcraft | | | | |
| d. Survival skills | | | | |
| e. Outdoor Safety | | | | |
| f. Nature crafts | | | | |
| g. Water sports | | | | |
| h. Hunting skills | | | | |
| i. Fishing skills | | | | |
| j. Field sports | | | | |
| k. Winter sports | | | | |
| l. | | | | |
| m. | | | | |
| n. | | | | |

| | A | B | C | D |
|---|---|---|---|---|
| ENGINEERING SKILLS | | | | |
| a. Landscape planning | | | | |
| b. Land surveying | | | | |
| c. Map drawing | | | | |
| d. Land Use Planning | | | | |
| e. | | | | |
| f. | | | | |
| g. | | | | |
| NATURE STUDY | | | | |
| a. Tree identification | | | | |
| b. Wildflower Identification | | | | |
| c. Bird identification | | | | |
| d. Insect identification | | | | |
| e. Photography | | | | |
| f. Taxidermy | | | | |
| g. | | | | |
| h. | | | | |
| i. | | | | |

| | A | B | C | D |
|---|---|---|---|---|
| NATURAL RESOURCES | | | | |
| a. Conservation (history, philosophy, concepts) | | | | |
| b. Management (Forest, soil, water, wildflower) | | | | |
| c. Pollution (Problems and controls | | | | |
| d. | | | | |
| e. | | | | |
| f. | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

II.

5. In general, how well have teacher preparatory institutions prepared teachers in conservation and/or outdoor education?

_____ Excellently _____ Fairly _____ Poorly

How long have you been actively associated with conservation and/or outdoor education activities as a professional or leader?

_____ Less than five years
_____ Five to ten years
_____ More than ten years

Your highest academic degree _____
Degree major _____
Minor _____
Received from _____
Located at _____
Year _____

# APPENDIX B

## SUMMARY RESPONSE TO QUESTION 4 OF THE OPINION STUDY

SUMMARY OF AREAS OF KNOWLEDGE

| IMPORTANCE LEVEL CODE | A | B | C | D | NO RESPONSE |
|---|---|---|---|---|---|
| Areas of Knowledge: | | | | | |
| Biological Sciences | | | | | |
| a. General Biology | 20 | 28 | 3 | 0 | 6 |
| b. General Botany | 11 | 37 | 10 | 2 | 7 |
| c. Field Botany | 19 | 31 | 10 | 3 | 4 |
| d. General Zoology | 10 | 36 | 14 | 1 | 6 |
| e. Field Zoology | 17 | 29 | 10 | 3 | 8 |
| f. Ecology | 43 | 15 | 2 | | 7 |
| g. Field-Lab-Taxonomy | 1 | | | | |
| h. Cons. Biological Research | 1 | | | | |

NOTES: COMPETENCY LEVELS

A - thorough understanding of the subject area with instruction and/or leadership competency.
B - general knowledge of the subject area without instruction or leadership competency.
C - acquaintance with the subject matter only.
D - not necessary for teachers.

SUMMARY OF AREAS OF KNOWLEDGE

| IMPORTANCE LEVEL CODE | A | B | C | D | NO RESPONSE |
|---|---|---|---|---|---|
| Areas of Knowledge: | | | | | |
| Physical Science | | | | | |
| a. Geology | 19 | 39 | 8 | 1 | 1 |
| b. Oceanography | 4 | 18 | 36 | 2 | 7 |
| c. Astronomy | 3 | 12 | 40 | 6 | 6 |
| d. Meteorology | 5 | 22 | 30 | 3 | 7 |
| e. Chemistry | 5 | 21 | 36 | 1 | 4 |
| f. Physics | | 2 | 2 | | |
| g. Forestry | | 1 | | | |
| h. Microbiology | | | 1 | | |

NOTES: COMPETENCY LEVELS

A - thorough understanding of the subject area with instruction and/or leadership competency.
B - general knowledge of the subject area without instruction or leadership competency.
C - acquaintance with the subject matter only.
D - not necessary for teachers.

SUMMARY OF AREAS OF KNOWLEDGE

| IMPORTANCE LEVEL CODE | A | B | C | D | NO RESPONSE |
|---|---|---|---|---|---|
| Areas of Knowledge: | | | | | |
| Social Sciences | | | | | |
| a. Sociology | 28 | 18 | 16 | 0 | 5 |
| b. Archaeology | 0 | 21 | 36 | 5 | 5 |
| c. Geography | 16 | 33 | 12 | 0 | 6 |
| d. Political Science | 13 | 32 | 13 | 1 | 8 |
| e. Psychology | 8 | 33 | 18 | 2 | 6 |
| f. Indian Lore | 1 | 8 | 34 | 16 | 8 |
| g. Folk Lore | 0 | 7 | 44 | 14 | 2 |
| h. Economics | 2 | 4 | | | |
| i. Natural Resources | 1 | | | | |
| j. Anthropology | | 1 | | | |

NOTES: COMPETENCY LEVELS

A - thorough understanding of the subject area with instruction and/or leadership competency.
B - general knowledge of the subject area without instruction or leadership competency.
C - acquaintance with the subject matter only.
D - not necessary for teachers.

SUMMARY OF AREAS OF KNOWLEDGE

| IMPORTANCE LEVEL CODE | A | B | C | D | NO RESPONSE |
|---|---|---|---|---|---|
| Areas of Knowledge: | | | | | |
| Environmental Education | | | | | |
| a. Environmental Education (concepts, history, philosophy) | 32 | 25 | 5 | 2 | 2 |
| b. Conservation Education Methods | 39 | 18 | 3 | 2 | 5 |
| c. Environmental Education Program Administration | 18 | 34 | 9 | 3 | 3 |
| d. Environmental Education Area and Facility Development | 17 | 23 | 15 | 5 | 3 |
| e. Outdoor Teaching Methods | 44 | 18 | 3 | 1 | 1 |

NOTES: COMPETENCY LEVELS

A - thorough understanding of the subject area with instruction and/or leadership competency.
B - general knowledge of the subject area without instruction or leadership competency.
C - acquaintance with the subject matter only.
D - not necessary for teachers.

SUMMARY OF AREAS OF KNOWLEDGE

| IMPORTANCE LEVEL CODE | A | B | C | D | NO RESPONSE |
|---|---|---|---|---|---|
| Areas of Knowledge: | | | | | |
| Outdoor Leadership | | | | | |
| a. Camp administration | 8 | 10 | 29 | 16 | 4 |
| b. Camp counseling | 9 | 12 | 29 | 14 | 3 |
| c. Field Program Development | | 1 | | | |
| d. Accounting and Budgets | 1 | | | | |

NOTES: COMPETENCY LEVELS

A - thorough understanding of the subject area with instruction and/or leadership competency.
B - general knowledge of the subject area without instruction or leadership competency.
C - acquaintance with the subject matter only.
D - not necessary for teachers.

SUMMARY OF AREAS OF KNOWLEDGE

| IMPORTANCE LEVEL CODE | A | B | C | D | NO RESPONSE |
|---|---|---|---|---|---|
| Areas of Knowledge: | | | | | |
| Outdoor Skills | | | | | |
| a. Camping skills | 7 | 15 | 32 | 11 | 2 |
| b. Orienteering | 9 | 14 | 39 | 4 | 1 |
| c. Woodcraft | 7 | 7 | 34 | 15 | 4 |
| d. Survival skills | 13 | 11 | 26 | 13 | 4 |
| e. Outdoor Safety | 26 | 17 | 17 | 4 | 3 |
| f. Nature Crafts | 11 | 14 | 29 | 9 | 4 |
| g. Water Sports | 3 | 9 | 33 | 19 | 3 |
| h. Hunting skills | 3 | 6 | 34 | 20 | 4 |
| i. Fishing skills | 3 | 7 | 34 | 19 | 4 |
| j. Field sports | 3 | 8 | 34 | 18 | 4 |
| k. Winter sports | 3 | 8 | 39 | 14 | 3 |

NOTES: COMPETENCY LEVELS

A - thorough understanding of the subject area with instruction and/or leadership competency.
B - general knowledge of the subject area without instruction or leadership competency.
C - acquaintance with the subject matter only.
D - not necessary for teachers.

SUMMARY OF AREAS OF KNOWLEDGE

| IMPORTANCE LEVEL CODE | A | B | C | D | NO RESPONSE |
|---|---|---|---|---|---|
| Areas of Knowledge: | | | | | |
| Engineering Skills | | | | | |
| a. Landscape Planning | 10 | 14 | 27 | 12 | 4 |
| b. Land Surveying | 6 | 13 | 31 | 13 | 4 |
| c. Map Drawing | 7 | 25 | 23 | 8 | 4 |
| d. Land Use Planning | 18 | 21 | 22 | 4 | 2 |

NOTES: COMPETENCY LEVELS

A - thorough understanding of the subject area with instruction and/or leadership competency.
B - general knowledge of the subject area without instruction or leadership competency.
C - acquaintance with the subject matter only.
D - not necessary for teachers.

SUMMARY OF AREAS OF KNOWLEDGE

| IMPORTANCE LEVEL CODE | A | B | C | D | NO RESPONSE |
|---|---|---|---|---|---|
| Areas of Knowledge: | | | | | |
| Nature Study | | | | | |
| a. Tree identification | 13 | 34 | 14 | 2 | 4 |
| b. Wildlife identification | 11 | 34 | 15 | 3 | 4 |
| c. Bird identification | 11 | 34 | 16 | 2 | 4 |
| d. Insect identification | 12 | 31 | 18 | 2 | 4 |
| e. Photography | 11 | 20 | 30 | 6 | 0 |
| f. Taxidermy | 3 | 7 | 34 | 21 | 2 |
| g. Wild Animal Development | 2 | | | | |
| h. Geology and Soils | 2 | | | | |

NOTES: COMPETENCY LEVELS

A - thorough understanding of the subject area with instruction and/or leadership competency.
B - general knowledge of the subject area without instruction or leadership competency.
C - acquaintance with the subject matter only.
D - not necessary for teachers.

SUMMARY OF AREAS OF KNOWLEDGE

| IMPORTANCE LEVEL CODE | A | B | C | D | NO RESPONSE |
|---|---|---|---|---|---|
| Areas of Knowledge: | | | | | |
| Natural Resources | | | | | |
| a. Conservation (concepts, history, philosophy) | 40 | 20 | 7 | 0 | 0 |
| b. Management (Forest, Soil, Land, Water) | 17 | 34 | 12 | 0 | 4 |
| c. Pollution | 34 | 27 | 3 | 0 | 3 |
| d. Human Ecology | 5 | 0 | 0 | 0 | 0 |
| e. Game Habitat Management | 1 | 1 | 0 | 0 | 0 |
| f. Land Use Economics | 0 | 0 | 1 | 0 | 0 |
| g. Population Control | 1 | 0 | 0 | 0 | 0 |

NOTES: COMPETENCY LEVELS

A - thorough understanding of the subject area with instruction and/or leadership competency.
B - general knowledge of the subject matter only.
C - acquaintance with the subject matter only.
D - not necessary for teachers.

# APPENDIX C

## SELECTED ADDITIONAL COMMENTS DERIVED FROM THE SURVEY RESPONDENTS IN THE MAILED QUESTIONNAIRE

QUESTION 1

Should studies for teachers in outdoor and/or conservation education be offered by preparatory institutions?

SELECTED COMMENTS:

a. This needed field of specialization demands that courses and experiences be offered to all teachers. Thus, one needs graduate courses to prepare for this.

b. Conservation is not a subject. It must be built into existing programs at all levels.

c. A major emphasis is necessary to prepare individuals to be teachers and leaders in the field.

d. Not a minor, but included in all courses.

e. A minimum requirement for everyone not just teachers, but engineers, attorneys, M.D's., etc.

f. Some core of 1 - 3 courses should be required of all. Extent to which this could become an area of major emphasis at teacher preparatory institutions at graduate level would seem to depend on resources and balance with other programs.

g. I feel that a Master's degree should be offered in environmental studies rather than the standard Master's in education, many required education courses are non-relevant and lack content.

h. I am definitely convinced that all of the above are needed and will become increasingly important, environmental problems are here to stay and we need qualified educators to interpret and teach.

i. All teachers should take at least a content course. A second course in teaching conservation would be desirable.

j. Environmental problems are becoming so important that we should offer every opportunity for young people to become knowlsdgeable of what is happening and to develop skills in solving these problems.

k. Environmental education must be a dimension of the entire curriculum--science, mathematics, social studies, geography, political science, etc. We must get away from treating environment only as a separate "course"

by insisting on nice, neat little academic cubby-holes for it.
The traditional "outdoor education" concept is far, far too narrow a viewpoint.
Environment is not a course; it's a value system, a social ethic, a philosophical overview.

l. Environmental education (not conservation or outdoor education) should receive EQUAL and INTEGRATED emphasis in entire program and not as a SEPARATE course or thrust.

m. Environmental education must deal with the gusty issues of people--too many people. We must deal with the politics and the social pressures which determine resource use and allocation. It is not enough to point a finger at industry and say "shame for polluting our rivers and air." We must learn the economics and the cultural patterns which have lead us into this mess.

n. Too important an area to be ignored on any level.

o. A series of required courses in environmental education should be mandatory.

p. For elementary teachers, 2 or 3 courses emphasizing integration of environmental education with other topics and used with school ground, outdoor labs, and discovery techniques.
For secondary teachers, it depends on major. If all social science secondary students were to have a required 2 or so courses--courses well designed, broad integrating--that would be a big move in the right direction. Certainly masters and doctorate environmental programs as majors are needed, to train people who can give the kind of undergraduate environmental education needed.

q. Preferably incorporated into each and every course, and conservation education should be incorporated into the courses in elementary and secondary studies. Additionally: In programs of teacher preparation for natural and physical science courses such as listed on the areas of knowledges list on the next page; however, outdoor and/or conservation education should be given major emphasis

r. Prospective students should have science background then education graduate work or vice-versa. A field practicum should also be required.

3. Care must be exercised that environmental education does not become specialized as a separate degree program in the preparation of teachers. It needs to be diffused throughout all programs so that teachers are exposed and understand how man is a part of his environment. This knowledge, with skillful instruction, can then be applied to whatever course is to be taught. In the past, the tendency has been to segment courses and programs. The knowledge gained becomes difficult to pull together and make practical application in our way of life and our relationship with our surroundings.

QUESTION 2

How many REQUIRED courses in conservation and/or outdoor education should be included in all undergraduate teacher education curricula?

SELECTED COMMENTS:

a. All teachers should be aware of this subject matter area to some degree. Whether an awareness can result from one course or two or more depends on many variables.

b. Outdoor education techniques should be an integral part of all appropriate courses. Students who wish to strengthen themselves in outdoor education may elect courses.

c. I think it will take at least two courses to give students a basic understanding of the importance of conservation and/or outdoor education.

d. One basic course might be required. Through your counseling program students would be encouraged, rather than required to become involved in other courses and activities.

e. Required courses to integrate: ecology principles; conservation concepts, history, philosophy and response of social, political, economic institutions to changing values and technology. This is to be handled in various ways so hard to reduce to number of courses--could be one.

f. There is no such thing as conservation and/or outdoor education. I cannot accept this so that it is impossible for me to answer your questions.

g. Environmental education should have the very highest priority. After all, the liability of the earth is at stake. We have failed in the past, not making it a part of everyone's schooling.

h. Teachers must be taught to provide an "environmental ethic" for all courses they teach. Just as they do now with economic ethic.

i. One course to provide academic base, second course geared to educational aspects of environment stressing the interdisciplinary aspects.

j. At least two courses would be necessary to introduce individuals to the biological and social implications of this area of study.

k. Depends completely on the content, none if there is only superficial treatment, two or three good "gusty" courses dealing with contemporary issues, at best.

l. Careful examination of current curricular offerings, should reveal ways and means of incorporating desired content and experiences as an integral part of courses.

m. The present emphasis on the environment necessitates two working courses with the knowledge of the environment since teachers are "expected" to "be in the know."

n. Ecology and conservation of natural resources are basic.

o. I would not like to think of just adding additional course work per say. I would prefer to identify what needs to be taught and then assess how to fit it in--a new course sequence or revised older course work.

p. A minimum of three courses should be offered--general ecology, outdoor interpretive technique, environmental education.

q. Outdoor education can be taught without any conservation implications. With a college faculty geared to survival and environmental problems and relationships, you would not need any course because the philosophy would permeate all, but no one has come up with such a faculty as yet.

r. At least six credits, preferably more with methods courses predominating.

QUESTION 3

What are the BEST means to reach IN-SERVICE teachers who have not had formal academic studies in conservation and/or outdoor education?

SELECTED COMMENTS:

a. I think the BEST means is through undergraduate studies. It has been my experience that most teachers who participate in IN-SERVICE workshops have some experience or related interest in outdoor education. The bulk of teachers do not participate without some prior interest or added incentive such as in-service credit.

b. We offer workshops on week-end basis, summer graduate courses and have found real response to them and tremendous carry over to the implementation of programs in public schools in New York.

c. All have useful applications. I favor stressing urgency of bringing all teachers up to some desired foundation level of understanding so that this could be built upon with local in-service education of brief duration. And, doing this soon--within 18-24 months. Pull leaders (the department heads of science and social studies coordinators) into special summer courses; have them help train others who meet week-ends and afternoons. Provide incentives--time and money, and RECOGNITION!!

d. The best bet is to develop a credit course, also a cooperative effort with consultants in Harrisburg, also special organizations such as Forest Service, etc., groups with extensive facilities. Slippery Rock should check the possibility of using the closed Job Center at Marienville as a permanent outdoor laboratory.

e. I am involved with successful programs in all of the above areas. There is a definite need for in-service programs and we find that teachers do begin to develop skills and self-confidence that aid them in their teaching. These programs must be broad and multi-disciplinary.

f. I am not too sure about how use "formal courses" may be. Other means of developing environmental awarenssa and expertise may be more effective--workshops, seminars, teach-ins, camping, survival training programs, oceanography explorations, etc.

g. Teachers could gain much by being active participants in conservation and outdoor education related organization.

h. Perhaps emphasis should be placed on the better two responses through which I can see when all could be used as complements of one another where feasible. The first two certainly would not provide an opportunity for very intensive study, and I am not sure the format of more conferences (third response) is indecisive to learning as might be learned under the latter two alternatives.

i. This is a tough one. We have been attempting for a number of years to train teachers, but the time factor is a major stop gap. I have checked all of the above categories because all are being used with some degree of success.

j. All of these seem as legitimate ways of reaching in-service teachers based on past patterns. I would prefer a more drastic change, that of offering such course work during the teaching day, and freeing teachers to work content and approaches as an ongoing part of the daily teaching.

k. Need a field oriented setting, best done in at least one week.

l. A central information source on environmental matters, to keep teachers informed of developments in environmental improvement and problem areas may have some merit.

m. Our experience has revealed the graduate credit area or salary increment requirement as the most valuable incentive.

n. All providing (1) is required, (2) they get credit. The only teachers volunteering for this are already motivated environmentalists, already teaching in this framework.

o. Answers here depend somewhat on the availability of assistance in the form of staff, materials, and laboratory and/or demonstration areas. Making such programs acceptable for advanced degree credit more generally would provide a much needed incentive for in-service teachers. Wiconsin has done this, and probably other states as well.

QUESTION 4

In order for teachers to provide their students with an understanding of the environment and its problems, it is necessary that teachers be prepared with certain environmental (conservation-outdoor) education competencies. Please indicate the COMPETENCE LEVEL you feel appropriate for teachers in those AREAS OF KNOWLEDGE shown below, and add any additional comments you may desire.

SELECTED COMMENTS:

a. This question is particularly difficult and I feel that it is relatively, invalid because one must consider the type of outdoor or environmental problem he wishes to institute; the direction that he wishes to go and the environment in which the program will operate. The items could all be A,B,C,D, depending upon these factors and the specific and general objectives of the teacher (and also his own academic and practical training and experience). You can see by my responses to the lengthy discipline area questions above that I strongly believe in concept and methodology as paramount to the environmental program. What one does after that must relate with these objectives and understandings.

b. As in the usual case you have concentrated on "Areas of Knowledge" or "Subjects" or content. Most of this can be learned as you work into an outdoor education program.
The areas I feel are important are: Sensitivity training, educational psychology, learning theory, teacher-pupil relationsips, experience in unstructured learning situations, group processes, group dynamics, small group learning, understanding of humaneness, understand what it means to be authentic, development of self-concept. All knowledge is worthless, if you do not have human understanding.

c. These are disciplines, not subject areas. I cannot answer these with any meaning. To know something in each, but what something.

d. I feel strongly that teachers should receive much of their environmental education out-of-doors. They need to know introduction to the natural world by an enthusiastic naturalist-teacher. Developing a feeling,

and a concern for the earth should be a primary objective. There is no substitute for the outdoors when teaching environment of education.

e. The validity of this questionnaire is dependent upon one's conception of what definition of environmental education you advocate. Recreation skills and nature study do not fit into my definition but may be appropriate for others.
I feel need to be more specific in the areas of sociology, psychology, political science, and communication skills, as well as ecology. You also need human ecology.

f. There is too much overlap and ambiguity in this scheme. It seems to be developed along traditional lines of bits and pieces (academic departure and disciplines) for the most part. Most of the substance is part of general education. Why not be daring and search for some creative organizational pattern of approach! Academic understanding is only part of the job.

g. The present emphasis in environmental studies is the inter-relation of all the above skills, and any sufficient treatment of the subject, therefore, requires a knowledge of the role played by each of the above areas. Whether A or B is required is difficult to say since all are part of an inter-related whole.

h. Teachers need enough identification and techniques for identifying to keep them from feeling totally illiterate and incompetent but, basically, they need to learn to read the landscape and discover problems and relationships.
Any skill that makes people feel at home in the out-of-doors helps, but the underlying philosophy counts. Taxidermy can be a wonderful hobby that develops interests, skills and a feeling for a career of collecting without any concern for wildlife. Environmental education needs to start with the total environment. Soil conservation techniques have no place in a beginning urban program, but solid waste--air pollution, etc. Ultimately, however, the city dweller must know that he depends on proper land management for his food and that his responsibility as a citizen includes supporting good management programs--even as that rural individual needs to learn of his involvement in urban problems.

# APPENDIX D

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